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The Preservation of Natural Beauty.

IT is now more than five years since the body known as the Trustees of Public Reservation was incorporated under an act of the Legislature of Massachusetts, for the purpose of preserving tracts of land which were distinguished for their natural beauty or for their historic association. This was the first organization of the kind ever established, so far as we know, and it seemed to us then, as it does yet, a proof of more than ordinary enlightenment and public spirit in the society out of which it grew. We expressed the hope then that this might become a settled policy throughout the country, for it certainly is not too much to expect that a community of civilized people would take upon themselves the duty of preserving and transmitting to their children the treasures of beauty which they have inherited, or of protecting from defacement and ruin places made memorable by patriotic sacrifices and noble deeds and preserving them for the inspiration of their descendants. New York has enacted a similar law, and steps have been taken for saving some of our revolutionary battle-fields and other noteworthy places from desecration. The movement for saving the Palisades in New Jersey is the outcome of a similar sentiment, and so is the rescue and devotion to public use of that magnificent river gorge known as the Dalles of the St. Croix, between the states of Minnesota and Wisconsin. The acquisition of Niagara by the state of New York and of Valley Forge by Pennsylvania are noteworthy results of the same feeling.

It was the example of Massachusetts which suggested an article in *The Spectator*, of London, in which it was sharply pointed out that it was quite as important for a nation to secure sites of great natural beauty as it was to buy fine pictures. And since Snowdon had already been in the market, and the waterfall of Lodore was advertised for sale, it was urged that a national trust for places of historic interest or natural beauty was a necessity. Such a trust was therefore organized, and the trustees were made up of men eminent in letters and in public life. In a recent number of *The Spectator*, Miss Octavia Hill, who was one of the original incorporators of the trust, writes that the wild heathy promontory known as Barras Head, one of the headlands which enclose King Arthur's Cove at Tintagel, could be secured for a comparatively small sum; and, no doubt, there are enough people interested in the Arthurian legends and the poetry that has gathered about them, to rescue this delightful spot and dedicate it to public use forever. In the same letter it is stated that a lovely bit of old English architecture, a clergy-house built before the Reformation, in a Sussex village, had been acquired as an inheritance from the middle ages. It is encouraging to see good work like that in Massachusetts bearing fruit across the sea, and we are sure that men and women of public spirit, who urge a policy of this sort upon the General Government and the government of the separate states, will minister to some of the noblest and purest emotions that animate the human soul, while they will accomplish a work which is eminently practical, even from the sordid dollar-and-cent point of view, and add a distinct pecuniary value to all property which surrounds these places.

The setting apart of the great forest reservations of the west by the General Government is, of course, a different matter. But the establishment of Yellowstone Park and the acquisition of the great battle-fields of the Rebellion are justified only by a sentiment that the places which are remarkable for the sublimity and beauty of their natural features, or which have been consecrated by heroic struggles for principle, are, or ought to be, possessions of the people as a whole. But if the people, speaking through their representatives, have asserted their rights in such conspicuous instances, they certainly must feel that their unwritten rights are often invaded by private persons and corporations when they find the scenery which they have enjoyed all their lives needlessly defaced. In some cases laws have been enacted to protect them in this matter. In this city the obtrusive ugliness of signs and advertisements within a certain distance from park territory can be mitigated by the action of the Park Board, but all over the country, landscapes are blotted out by billboards and made hideous by the paint pot of the advertiser, and there is no redress against the outrage. If a private citizen is willing to devote his property to such use he can violate the sensibilities of his neighbors and of all who travel on the highway with impunity. Since there is law against offensive smells and useless noises, there seems to be no injustice in compelling property owners to respect that love for beauty which, to some degree, is implanted in the nature of every one. A loathsome sight is certainly as disagreeable as a foul smell.

What is needed primarily is not, however, law, but a sensitive public conscience which will impel every citizen to respect the feelings of his neighbors. In a truly enlightened community a corporation which was building a railroad would not needlessly gash and scar the landscape. They would no sooner think of destroying the beauties which are the inheritance of all than they would of recklessly destroying property, for which they would be held in pecuniary damages. We can remember a White Oak-tree which had stood beside an old highway in New Jersey for generations. It was a stately tree before the war of the Revolution. It was an essential feature in a beautiful prospect, and it had been admired and reverenced by thousands who traveled on that road until they felt a personal interest and proprietorship in it. One day the owner of the abutting land cut down this tree for apparently no reason whatever, for it did no injury to the land, and the log was left to rot by the wayside, but every one who has passed the stump since that day feels a sense of bereavement. A noteworthy landmark of the country is obliterated. The whole place is distinctly less interesting, and will be forever.

The sum of the whole matter is that while the established boards of trustees for acquiring public reservations mark an advance in public sentiment, and while these organizations are already doing a noble work and deserve the fullest sympathy and most substantial aid, what we

need still more is a wider appreciation of and love for natural beauty. The people who take a genuine delight in natural scenery and are conscious of its soothing influence are not likely to deface or destroy it. Besides this they can realize that others have rights in the general beauty of the land in which they live, and they can be persuaded to respect those rights. Neither you nor I may have a legal property right in Niagara or the field of Gettysburg, but every American would feel that he was robbed of something to which he had a moral right if either of these places were turned over to sordid use. The sublimity, the poetry, the inspiration of places like these are a common heritage. These influences should be guarded as jealously as any other common right.

Under the title of "The Coming Fruit," Dr. D. Morris, of Kew, not long since wrote a letter to *The Saturday Review*, urging upon the people of the West India Islands to establish groves of Grape-fruit trees of the best quality. When passing through New York in the early part of this year, Dr. Morris was very strongly impressed by the quantity of this fruit which the New York market was demanding, and our readers will, perhaps, remember an article in the present volume of Garden and Forest, on page 163, in which he gives a sketch of the origin and history of the Shaddock, Pomelo, Grape-fruit, Forbidden-fruit and other varieties which belong to this group of Citrus fruits, and are botanically classified under the species Citrus decumana. They are quite distinct botanically from true Oranges, Citrons or other groups of the Orange family, and since they have mostly been raised from seed with little care given to selection, they vary widely in quality. The frost which ruined the Orange groves of Florida has temporarily shortened the supply, and Dr. Morris quotes a paragraph from this paper recalling the sale of small-sized grape-fruit at thirty dollars a barrel. This means a retail price of at least a dollar each, and is, as Dr. Morris suggests, probably the highest price ever paid for specimens of the orange tribe.

No doubt, it will be a long time before there is any overproduction of grape-fruit, since the demand for it increases every year, and it is constantly becoming more popular as a breakfast fruit. It is beautiful, is said to have medicinal value, and the more it is used the more highly it is relished. Beyond question it would be a profitable fruit to raise in the West Indies, and probably the English people will in time prize it more highly than they now do, and furnish an additional outlet for West Indian groves. Since the Florida frost this country has absorbed almost the whole West India supply, although much of it has been very inferior in quality. How does it happen that the enterprising orchardists of California have not been awake to the situation? There is no reason why they should not supply the east during a part of the year with all the grape-fruit needed. The limited quantities thus far received from California have lacked weight and juiciness. Wherever the fruit is grown it should be borne in mind that the highest success will only come with the use of the best varieties. There is no need to grow the thick-skinned and bitter sorts, or those with a dry, cottony pulp, when there are varieties both of the apple-shaped and pear-shaped fruits with silky skin, full of juice and of a most delightful flavor, with just enough bitter to give it piquancy and suggest its tonic quality.

An April Scene in Central Park.

By the time this paper reaches our readers it is to be hoped that the weather will be cooler, but as we write the country is passing through one of those periods of intense heat, accompanied by a high percentage of humidity, which are characteristic of our climate. The deaths in this city and its suburbs, directly due to the temperature, during the past week are numbered by hundreds, so that the cool picture on page 335 seems like a mockery, or, at least, not especially seasonable. We present it at this time, however, not primarily because of its beauty, although on the day when it was taken there were many portions of Central Park where the branches of conifers, bending beneath their weight of snow, made strikingly beautiful combinations. Just now, however, it will help to illustrate in a forcible way the character of our short spring season if the date of this snow-storm is taken in connection with the weather which immediately followed. On the fourth of April last the thermometer registered twenty-four degrees, Fahrenheit, and on the day preceding the mean between the lowest and highest temperature was two degrees below the freezing-point. Just one week later the mercury had risen to seventy-nine degrees, where it remained for two days, then rose on the 16th as high as eighty-seven degrees, and on the 18th, only eleven days after the snow-storm, it touched ninety-one degrees, which is about the temperature of these August days, when men and horses are dropping dead in the street from the heat. Nor did it at once subside to what may be called normal April weather, but it kept about eighty degrees for several days following. Of course, a temperature like this forced early vegetation into something like a hot-house growth. As the result of this August weather the Yulan Magnolias burst into bloom in mid-April, close after M. stellata, with the Forsythias, our native Spice-wood, Cornus mas, the early Bush Honeysuckles and some of the Prunuses, while the Peach-trees were in full bloom only a few days later.

All this can be readily understood by persons who are familiar with our spring weather, but it is so remote from any experience of our English readers that they can hardly appreciate such an abrupt transformation. As a rule, the early bulbous plants commence to flower in England several weeks before they do in this country, and then slowly and gradually there follow two or three months of spring weather until summer arrives in earnest. It may be practically winter here while Daffodils in England are at their best. But in a few days the season here will be abreast of the year in London, as our summer follows hard upon the heels of winter. One morning the woods will show a mist of tender green and the next they will appear almost in full leaf. Of course, such climatic difference as this must be taken into account when we undertake to grow plants which have developed under widely different conditions. No doubt, the people of England prefer their springs, and we can understand how attractive their slowly developing spring gardens must be. But we do not forget that the sudden leap into summer also has points of interest for the lover of nature, wild and cultivated. The new creation is a fresh surprise to us every year, and the suddenness with which vegetation bursts into life never fails to bring new surprises.

The Pines in August.

The Pines near the coast are brilliant now with the Swamp Hibiscus. This magnificent plant, with large showy flowers five and six, and some even seven inches across, are thickly scattered over large areas. Some of the plants bear pure white flowers, others are white with a deep crimson eye, while others have varying shades of rose and peach-blossom color. It grows fairly well in the garden. Three or four summers ago I planted a small seedling in the border; to-day it has six stout stems with numerous branches laden with flowers, and is one of the most conspicuous things in the garden. Some of the flowers are seven inches in diameter, pure white, with a crimson eye. Kosteletzkia is a handsome plant of the same family, much like the Hibiscus, only smaller every way; the rose-purple flowers are about two inches across and do not vary in color like the Hibiscus. It is quite common near Wildwood, but not so abundant as the Hibiscus. Not far from Kosteletzkia the Glade Mallow, Napæa, is growing in a place where I supposed no conspicuous plant could escape me, yet here it was in an open damp place near a railroad. It is a tall herb with very large leaves, and the flowers are so arranged that with the

first glance I took it to be an umbelliferous plant. It is not specially handsome, but it is rare and unlike most of the Mallow family; more like a Sida than any other member of the order. Parthenium integrifolium is another plant that I had not found until this summer. It is a composite two to three feet high, with a flat corymb of white woolly flowers, and it remains in bloom a long time.

Clethra is an unusually handsome shrub just now, the long spikes of white fragrant flowers almost completely enveloping the bushes, which are very free from insect depredators both on foliage and flower, are perfect. This shrub merits a place in every flower garden; it is easy of culture; in fact, it will grow fairly well without any cultivation. I have a dozen or more plants in my wild garden, which receive no special care, and they are now full of flowers. The Button-bush is also attractive and grows everywhere in damp places. In the thickets wild Roses are still blooming almost as luxuriantly as in June. The Trumpet Honeysuckle is lovely, too, and combines well with the Roses, while Hypericums and Spiræas also add their charm to every mass of shrubs.

The two species of Meadow Beauty, Rhexia Virginica and R. Marianna, are both conspicuous among the Grasses in the damp Pines, along with Polygala lutea and P. sanguinea, while the Lysimachias and Swamp Loosestrife and the pretty Coreopsis rosea are all here, and the flaming Cardinal Flower stands above them all. The hummingbirds and brilliant butterflies collect about the flower, seemingly attacted more by its brilliancy than by the sweets it furnishes.

Our Lilies are very showy now, especially L. superbum, with its great pyramid of nodding deep orange flowers, spotted on the inside with deep purple. Although it is called the Swamp Lily and grows naturally in low, wet ground, it thrives well in any position not too dry, and is especially handsome when grown in peaty soil like that usually furnished for Rhododendrons. Apios tuberosa is clambering among the shrubs and plants, catching hold of whatever it can reach, and often rising above its more showy neighbors, laden with short dense racemes of sweet-scented dull-purple flowers. Mikania scandens is also climbing among the bushes with panicles of flesh-colored flowers. The delicate rose-colored Sabbatias are coming into bloom, their dainty star-like blossoms thickly scattered among the feathery Grasses. They are among our most graceful wild flowers. Several species of Gerardia are showy now. G. purpurea and G. maritima, G. tenuifolia and G. auriculata are here, and in the more dry Pines we find the yellow ones, G. flava and G. quercifolia.

All through August the Ponds are more attractive than at any other time. Pond Lilies are still blooming, together with a host of other lovely flowers. The little Lake Flower is here, and so is the widely distributed Water-shield, Brasenia peltata. At least four continents can claim this plant. It is common in Japan, Australia and Africa, and I have read that it had been found in South America, but I believe this is not as yet well authenticated. The curious Utricularias, purple and yellow flowered, are abundant among the Lilies, and the little sacks are well-laden with the entrapped larvæ of mosquito, chironomus and entromoscans, and the Droseras in the more shallow places are entrapping the winged creatures, holding and folding their leaves around them in such a way that one seldom escapes.

Vineland, N. J. *Mary Treat.*

Foreign Correspondence.

London Letter.

Odontoglossum Wattianum.—This is one of the most beautiful of all Odontoglossums. It first flowered in the nursery of Messrs. F. Sander & Co. in 1890, when Mr. Rolfe described it as a probable natural hybrid between O. luteopurpureum and O. Lindleyanum. I saw a second plant of it in flower last week which appeared to bear evidences that O. Harryanum was one of its parents. It has tall-branched scapes, bearing numerous flowers with sepals and petals as large as, and colored similarly to, those of a good form of O. luteopurpureum. The lip is, however, its most striking feature; it is about two inches long and an inch wide, the margins fringed and slightly incurved, the apex acuminate, and the color white, with a few large blotches of magenta-purple on the apical half and numerous small spots of the same color on the basal half. The lip hangs almost vertically, so that its colors are well displayed. Hybrid Odontoglossums, so-called, are generally disappointing as well as enigmatical, but O. Wattianum, whatever its origin, is a gem which all Orchid growers may honestly covet. It is to be hoped that Messrs. Sander & Co. will succeed either in propagating a stock of it or in importing it in quantity.

Sobralias.—A large and well-cultivated collection of these plants is now to be seen in the nurseries of Messrs. F. Sander & Co., where they receive special attention, growing and flowering like weeds. There are few more pleasing Orchids than a good specimen of Sobralia macrantha or S. xantholeuca when in full flower, while a collection of a dozen or more distinct species and hybrids bearing numerous large variously colored flowers is a picture to delight the eye of any Orchid fancier. The best of the hybrids are S. Amesiana (xantholeuca × Wilsoni) and S. Veitchii (macrantha × xantholeuca), the former raised by Messrs. F. Sander & Co., the latter by Messrs. J. Veitch & Sons, and also by Messrs. Sander. Perhaps the most beautiful of all Sobralias is the white form of S. macrantha. This has enormous flowers of the snowiest white, except the rich yellow of the lip. S. Wilsoni was introduced from Central America in 1890. It is allied to S. Warscewiczii and has large white flowers tinted with rose and a yellow blotch on the lip.

Hippeastrum stylosum and H. reticulatum.—These two closely allied species of Amaryllis are now in flower in the stove, and they are decidedly beautiful, even when compared with those more gaudy offspring of the genus now so popular in the garden. Hippeastrum stylosum was first introduced three-quarters of a century ago, but it appears to have been lost for some time until again secured by Mr. O'Brien. It has bright green leaves an inch broad, an erect stout scape bearing an umbel of from three to eight flowers which are four inches long, trumpet-shaped, the upper part of the segments elegantly recurved and the color a close network of broad lines of rose-madder on a groundwork of a paler hue. H. reticulatum is not so rare a plant, and is grown here and there for its white-striped leaves (I have never seen a plant of it with wholly green leaves). Its flowers are like those of H. stylosum, but of a brighter red color, the reticulation also being more marked. It is an old garden plant, having been grown by Messrs. Lee, of Hammersmith, more than a century ago. Neither of these species has played any part in the production of the race of hybrid Hippeastrums.

Anthurium Sanderianum.—This is the name borne by an extraordinary seedling or hybrid Anthurium which I recently saw in flower at St. Albans. It resembles the hybrids raised from A. Andreanum and allies in its leaf characters, robustness of growth, etc., but it differs from all others in having a spathe which is almost a normal leaf in nervation and size, while in color it is scarlet in the lower half, bright green in the upper half. The spathe in Aroideæ is, of course, generally understood to be a slightly modified leaf, but it always differs widely in shape and structure from the true foliage. Imagine a plant with an inflorescence like that of A. Andreanum so far as regards rachis, spadix and form, but in place of the ear-like spathe colored bright scarlet, a large cordate leaf attached to the spathe colored scarlet and green. In the distance this spathe has the appearance of the leaf of a gaudily colored Caladium. The plant bore about half a dozen inflorescences in various stages of development, all showing the same peculiar character.

Lilium Henryi.—While a considerable number of species of Lilium have suffered more or less severely from the excessive heat and drought recently experienced here, Lilium Henryi has, on the contrary, exceeded in growth and vigor all previous experiences. I am inclined to believe that sunstroke is the cause of the sudden collapse of fat healthy stems of L. auratum, probably also of L. pardalinum and others, almost a failure here this year. But L. Henryi is now nine feet high, with healthy green leaves down to the base and a score or more of orange-yellow flowers and buds. It has not gone back in health in the slightest since its first introduction from China, some eight years ago, although it has been left in beds in the open without disturbance. It seeds freely and the seeds germinate readily. A solitary plant of it is not effective, but a quantity growing together, as, for instance, in the case of L. pardalinum, make a stately picture. I might mention here that I saw in the nursery of Messrs. F. Sander & Co. the other day a large healthy batch of the rare L. Philippinense, one of the most elegant of the Longiflorum group. It requires greenhouse culture in this country.

Marliac's Water Lilies.—The exceptional length and heat of the summer we are now experiencing—it began in April, and so far has been almost tropical—has favored some plants, and particularly the hardy Nymphæas, which in some gardens have flowered freely as well as grown luxuriantly. The new red-flowered varieties have improved under its influence, or, rather, I should say, their good qualities have revealed themselves so clearly that they are sure to find general favor as hardy aquatics. They do not grow so vigorously as the common Nymphæas, except, perhaps, that called Marliacea chromatella, which appears to be by far the freest grower; they are, therefore, plants that must have special care and be kept in positions where they are easily seen and got at. Some who have tried them in lakes or large expanses of water have for this reason decided to remove them into tubs or small tanks. When seen at close quarters they are most beautiful. I know no flowers that grow in water in the open air in this country with colors so charming as those of the varieties called Robinsoni, ignea, fulva and odorata rosea or exquisita. The best forms of Laydekeri are also first-rate.

Limnanthemum peltatum., better known, perhaps, by the name of Villarsia nymphæoides, is a most charming aquatic Gentian with floating leaves exactly like those of a Nymphæa and numerous erect-stalked bright yellow flowers. It is a native of the British Islands as well as various parts of Europe. In England, perhaps, the only locality for it is in various reaches of the Thames. It is abundant in a backwater separating the old deer park at Richmond from Kew Gardens, and it is also a conspicuous object in the lake in the latter establishment. If not already introduced into the United States, it is worthy of introduction, which may be possible either by seeds or rhizomes. No plant makes a more delightful picture on the water than this, which is in flower from June to August. It has lately attracted the attention of Mr. Grant Allen, who has contributed an interesting article upon it to the *Daily News*. Last year a pretty plate of it, prepared by Mr. Moon, was published in *The Garden*. Mr. Allen aptly likened the flowers to those of a Melon or Cucumber, but they are much more elegant in outline and delicate in texture, while the fringe of hairs surrounding the stamens adds a special charm. [This plant is common in aquatic gardens here, where it becomes almost a weed which it is difficult to exterminate.—Ed.]

Bedding Violas, or Tufted Pansies, as some prefer to call them, have increased rapidly in popularity during the last ten years. This is the result of considerable improvements made by breeders in the constitution of the plants and in the colors of the flowers. In all good gardens they are now largely used for spring and summer bedding. They succeed where the larger-flowered Pansy fails, and they make a perpetual display for several months. They have become so important that a society has been formed in their interests, and next week a conference will be devoted to them in Regents Park, when papers will be read by their votaries and the results of a trial of seedlings be made known. An exhibition of the plants and flowers will be held at the same time. This year has, perhaps, been one of the most unfavorable for these Violas. They have not been a success at Kew, notwithstanding liberal supplies of water during the hot dry weather. In gardens where the soil is colder and less gravelly than at Kew they have done better. They are most useful for early summer effects, and as they are easily kept from year to year and as readily multiplied as Verbenas they are sure to remain in favor.

London. *W. Watson.*

Cultural Department.

Water-lilies from Seed.

There is always a fascination in raising plants from seeds. It requires some mental exertion and more or less patience, for while some seeds take but a few days to germinate, others require several months, and Water-lilies are among the uncertain plants. Naturally, seed is sown when thoroughly ripe, but the conditions are not favorable for immediate germination in all instances, and they lie dormant until the proper season or conditions for growth arrive. In the case of Water-lilies (Nymphæa), both hardy and tender, the seed, if ripened early in August and self-sown, will germinate in a few days. Seeds of the Zanzibar type can hardly be kept until they can be cleaned before they germinate; but later on if the seed is sown naturally and deposited in the tank or pond where it has grown it will lie dormant all winter, germinate early in spring and produce flowering plants the same season. Thus, in New Jersey, Zanzibar Lilies may be grown as a hardy annual.

As to the vitality of the seeds of aquatic plants much depends on their condition, the temperature, etc., when they are stored. Nature suggests that aquatic seeds should be sown as soon as ripe, or deposited in humid surroundings for safe-keeping. In some instances this is an inviolable law, many species refusing to grow if allowed to become dry and remain so for but a short period. This is true of Victoria seed, Euryale, Nymphæa gigantea, and almost all of the hardy Nymphæas, Sagittarias and others. This is the season for ripening Nymphæa and other seed, and persons desirous of experimenting with Water-lilies in the way of raising seedlings will do well to note these suggestions. Seeds of all varieties of hardy Nymphæas should be sown now, and the earlier they are sown the larger the percentage that will germinate. If seed cannot be secured before fall it may be sown then, but if left until next spring the percentage to germinate will be small, indeed, and with some varieties (unless extra care is taken in keeping them over winter) not a seed will grow. In natural ponds, where the seed is deposited during the latter part of this month, it remains dormant until spring, when with lengthening days and increasing temperature the seed readily starts and grows rapidly. Nature should be followed as closely as possible where artificial means must be adopted. Where only a few varieties are grown the seed may be sown in four-inch pots or in shallow pans, using fine soil similar to that used for other flower seeds, and covering the soil with fine sand after the seed is sown. The pots should then be stood in water, not submerged at once, but thoroughly saturated. They should remain in this condition for two days and then be submerged. If seed pans are used the seed may be sown thinly and remain undisturbed should they germinate before spring. The pans are always handy to move. If the seed is sown in pots a shallow tub or tank is most convenient to keep them in. To secure them against being upset, an ordinary tub may be filled two-thirds with ordinary soil. The pots should be plunged to the level of the soil and kept filled with water. The tub may remain out-of-doors in the open sunshine until fall, when, with its contents, it should be stored in a cold house or cellar until spring. But if the seedlings appear during autumn they should be kept growing in congenial quarters. Seeds may also be sown in a tub filled two-thirds with good soil, and the seeds covered with sand. They should be protected from freezing in winter and in spring, and placed out-of-doors again. The seed comes up readily and the plants may be set in permanent quarters without the trouble of pricking off, and will produce flowers the same season. Seeds of the Zanzibarensis type, if sown now thinly in pans, as already recommended for hardy varieties, will make nice plants this fall and may be held over till spring, when they will become good plants early in the season.

Riverton, N. J. *W. Tricker.*

FIG. 44.—View in Central Park, April 7th, 1896, from a photograph taken by Lucien C. Landy for the American Museum of Natural History.—See page 332.

Notes from the Herbaceous Border.

STATICE LATIFOLIA is a hardy perennial which is very attractive in our borders just now. Its distinct character, its widely different appearance from any other plant now in bloom, and its usefulness for cutting unite to make it most desirable. We have well-grown plants with large masses of flowers four feet across. They are set at intervals about ten yards apart in the border, where they show up conspicuously beside such plants as Rudbeckia speciosa. The minute light blue flowers are produced in broad spreading panicles two feet or more in height. These panicles are singularly light and airy, but they last in good condition for several weeks, and, of course, are very useful for cutting. When mingled with other flowers they have the same effect as Gypsophila paniculata—that is, they are so light that they surround the whole as with a mist or halo, softening the colors and outlines of the stronger and brighter flowers in the mass. Our plants are well established and a single plant produces a number of panicles which form a dense round mass, composed of countless ramifications of flowering branches. The leaves are radical, broad, oblong elliptical, eight to ten inches in length and thick and leathery. To get good specimens this Statice must be planted in deep rich loose soil, in a sunny position. It is a very deep-rooting plant and does not suffer much from a dry summer. I have dug up plants whose thick roots were more than three feet down in the soil, and a deep, light loose soil is thus required. This plant never thrives so well if disturbed often, and it ought to be put in a position where it can be left for a number of years. About every fourth year we dig up all the plants from our herbaceous border and trench and enrich the soil. We are always careful to dig down deep under this Statice and get it up with a good ball of earth. It is easily raised from seed, but it takes the plants a number of years before they make a display of bloom like old-established plants. The native country of this plant is Siberia, and it was introduced from there more than a century ago. There are a number of other Statices in bloom now, but none of them are as good as this one.

The Wolfsbane, Aconitum lycoctonum, is a desirable border plant that thrives and blossoms here every season. A thrifty, stout, angular-branched perennial about four feet high, it has showy cream-yellow flowers, which are produced in dense, elongated clusters at the ends of the branches. The leaves on this plant have long stalks, are reniform in outline, and are deeply incised and toothed. It thrives best here in a slightly shaded moist position, and if it has a favorable situation it is not so particular about the kind of soil it is grown in. The common Monkshood, Aconitum napellus, is also in bloom in the border, and is a showy plant when well grown. It is some four feet in height, with dark green smooth or slightly downy deeply cut leaves. The flowers are showy and curved in long erect terminal panicles two feet in length. Another Monkshood which blossomed here this summer and promises to make a showy border plant is A. ranunculifolium. This species has a raceme of creamy yellow flowers more than a yard in length. Last year it was raised from seed which came from the Botanic Garden at St. Petersburg. The Monkshoods are all more or less poisonous and ought to be kept in the herbaceous border or in places away from the kitchen garden.

In the back row of the herbaceous border large plants of Gypsophila acutifolia are blossoming freely now. This is a strong-growing plant and attains a height of nearly five feet. Its stems are clothed with glaucous acute leaves. The flowers are of fairly good size, and they are produced in enormous large trichotomous panicles. Lepachys pinnata is a striking plant when well grown. Here it is four feet tall, the stems well clothed with pinnate leaves. Its flower-heads are produced abundantly and the showy part of the flower-head is the long, drooping, light yellow ray-florets. It is quite hardy and does best in a light rich soil and an open position.

One of the early perennial Sunflowers suitable for the back row of the herbaceous border is Helianthus rigidus. It grows about four or five feet high and the flower-heads are raised well above the foliage on long stems. Rudbeckia maxima is acceptable when not too tall. Its smooth glaucous foliage introduces a pleasing contrast of color among the other plants in the border at this time. It is a handsome species with stout erect stems clothed with large ovate or oblong leaves. Its flower-heads are large and produced singly, or nearly always so, on long peduncles. The ray-flowers are a pure yellow, and, being over two inches in length, make a showy head. The long columnar disk is conspicuous. In rich soil this plant grows eight feet high, but in a poor light soil its height is generally five or six feet.

Rudbeckia speciosa is a compact, showy and desirable border plant. Near the front of the hardy herbaceous bed it is now making a great display. It is about two feet in height and its stems are clothed with roughish hairy, irregular-toothed leaves. Those on the upper part of the stem are sessile and lance-shaped, and those on the lower part are petioled oval lance-shaped. The showy flower-heads are produced at the ends of the branches and they measure about three inches across. The ray-flowers are an orange-yellow color, while the globose disk is nearly an inch in length. This Rudbeckia grows well here in a sunny position in the border, and the plants are of good size, measuring eighteen inches across. Such clumps produce a large number of flower-stems and make a fine display while they are in bloom. The plant shows the effect of dry weather sooner than any other plant in the border.

Echinacea purpurea is a distinct composite plant well worth a place in the border on account of the singular color of its flower-heads. It is a rigid stout perennial from three to four feet high, and its lower leaves are ovate and long-petioled, while those on the upper part of the stems are ovate-lanceolate. The stems are terminated by a large showy flower-head. The ray-flowers are distinct in color from most of the Compositæ that adorn our gardens at this time, and are of a rosy purple color and two inches or more in length. A light sandy soil seems to suit it best.

The Japanese variety of Veronica longifolia named Subsessilis is in perfection now, and is one of the finest hardy Speedwells in our collection. It grows from two to three feet high here, and has shortly petioled leaves from two to four inches long. It has showy, dense, stout spikes of deepest purple-blue flowers. The plants are attractive and always win admiration when in bloom. It succeeds best here in an open position in good deep loamy soil. It is easily increased by division. This is a comparatively new plant, having been introduced from Japan less than twenty years ago.

Veronica Virginica is in bloom now, and its whitish blossoms are quite distinct. The flowers are produced in long dense-clustered spikes. The plants are about four feet in height, the leaves produced in whorls along the stems. More than a year ago seeds of the Japanese variety of this plant were received from the Royal Botanic Gardens at Kew. Plants raised from the seeds blossomed this summer. The habit and color of the flowers are like those of our native species, but the Japanese variety blossomed more than a month earlier; in fact, before V. Virginica had any signs of flowering. The plants, too, are more compact in habit than those of our species, but, perhaps, this difference will be changed with age. V. Virginica and the Japan variety grow well in the border in a sunny position.

Botanic Garden, Harvard University. *Robert Cameron.*

Some Novelties.—II.

POLYGONUM orientale pumilum album is the catalogue name of a new and really desirable garden annual. It grows about two feet high, begins to bloom early in June, and is covered now and promises to continue to produce its spikes of white flowers until frost. The plant is of good habit and would look well as an isolated specimen, or, better, when used next to or between Zinnias in a border. We hope to ripen seeds so as to have plenty for another year; only three came out of the packet purchased, but they came quickly and began to bloom when very small.

Cosmos as grown so far north is rarely enjoyed to its full extent outdoors owing to the frosts that usually cut it down, but last year we saw in Messrs. Suttons' trial-grounds a new race of early-flowering Cosmos which seemed to have merit, and this year it has been very generally distributed. We have had them in bloom for a month, so that they have got precocity, also the variety of colors, but it still remains to get good full flowers such as we see in the later varieties, but, doubtless, this will soon follow as the California cultivators get to work on them.

Crotalaria retusa, the annual golden-yellow flowering Pea, if it does not soon get to growing, will, I fear, not produce its racemes six to ten inches long of golden Sweet Peas. Hitherto it has absolutely refused to grow in spite of all coaxing. I wonder if this has been the experience of others.

Pennisetum Ruppellianum is the name of a new species of ornamental perennial Grass. The older and better-known species, P. longistylum, is one of the best known of border Grasses, and this one, according to promise, will produce crimson-purple plumes instead of white; a small packet of

seed has given us a nice lot of plants that promise to bloom later. It should be stated that these Pennisetums are not hardy, but can be easily wintered over with Tritomas and other half-hardy plants of similar nature. Beds of ornamental Grasses are very striking in suitable positions as isolated beds on the turf. Arundo donax and its variegated form, the three Eulalias (E. variegata, E. zebrina and E. univittata), the Pennisetums, and as a margin Ophiopogon Jaburan variegatum, are all admirable. This last is very beautiful, and perhaps the prettiest hardy variegated plant we have, and, though not a Grass, is very similar in appearance until the pretty spikes of blue flowers appear.

Spiræa Anthony Waterer is doing equally as well here as in its birthplace. Mr. Waterer remarked last year that its color was said to be not so good as when first exhibited, and the doubt presented itself that, perhaps, our hot sun might tend to fade the flowers, but no such effect is apparent. Very small rooted cuttings procured last spring are now flowering from every little twig, but next year, when the plants are stronger, we may expect to see it at its best. It is a dwarf shrub, but will prove very valuable for use as a marginal plant in decorative shrubbery, or even for summer bedding; it flowers perpetually.

Our greatest success this season has been with border Pentstemons treated as annuals. It was noted earlier in the year that this was the method now adopted by English growers, instead of keeping them over as rooted cuttings. The flower-spikes are very numerous now and will continue for some time in succession. It is a great satisfaction to know this, for many would grow them if it were known that the plants need not be wintered over. I doubt if the old plants will prove hardy, although the parents of this race are native North American plants; yet their identity is not easily traced now after about seventy years of hybridization. The colors vary from pure white to deepest crimson and purple, and the spikes resemble those of Foxgloves, but the flowers are in this strain much larger; the only thing they seem to insist on is rich moist soil, and we hope to mature seeds for a larger display another season.

South Lancaster, Mass. *E. O. Orpet.*

Solanum Wendlandii.—Last year this plant was very fine in the greenhouse later in the season, but was too rampant for any but a very large structure, so we have this year tried it out-of-doors in the border, where it has been in bloom during the past few weeks, and will a little later make a fine display; each small shoot has a terminal flower-cluster of the prettiest shade of lavender-blue, and as the plant is hard-stemmed it is easily wintered over and may be set out again year after year. It is a native of Central America, and the most beautiful of all flowering Solanums known to cultivators. We find it easy to propagate from young shoots taken from the plant grown in the greenhouse; those taken from strong growth of a planted out specimen last fall did not root owing to the abundance of sap in them. It is best to take them from pot-plants and root them in an open bed of sand; in the propagating-case all will rot off.

South Lancaster, Mass. *E. O. O.*

Correspondence.

The Compass Plant.

To the Editor of Garden and Forest:

Sir,—Is it true that there is on the prairies a Compass Plant, which is a safe guide for persons who get lost? I mean, do the leaves of this plant always point north and south so accurately that it would be a safe guide for one who was lost on the trackless prairie?

New Brunswick, N. J. *S.*

[This letter was referred to the Rev. E. J. Hill, of Chicago, who is familiar with the flora of this region, and writes as follows:

"The Compass Plant, Silphium laciniatum, may be taken as a fair guide for distinguishing a general north and south, from an east and west direction. There is a tendency in the leaves to polarity, so there is also in the Prairie Dock, S. terebinthinaceum, which, so far as I know, has not been spoken of as a Compass Plant. And yet if one runs his eye over a field where these plants occur he would probably find seventy-five per cent. of them with their edges pointing in a north-south direction. But in both cases it is necessary to take into account the age of the plant, and even the wetness or dryness of the season. It is the young plants which show the polarity best, or the leaves which become the radical leaves of the flowering plant. These twist more or less on the petioles, so as to present their faces to the east and west. But when the flower-stalk arises they are liable to drop away in various directions, some plants in a way so disorderly that no use could be made of them as a guide, others keeping their polarity very well. This is the case also, but in a less degree, with plants not sending up a flower-stalk, but whose leaves at the season are large and heavy. Those standing up stiffly show the best polarity, some quite effectually. The sessile leaves of the flower-stalk so twist the lower portion as to have the edges near the extremities, or the upper half, up and down, and with the meridional tendency. But this is hardly more so in the Compass Plant than in the stem-leaves of the Prickly Lettuce, Lactuca scariola, which, when standing in the full sunlight, twist in a similar way and have the meridional tendency. In a dry season, or with a lessened production of parenchyma, there is a diminished polarity. Professor B. D. Halsted (*Botanical Gazette*, July, 1887, page 161) has also noted this. In the cases he mentions the parenchyma was so reduced that the polarity was virtually destroyed, and the leaves would be useless as a guide. The way to use the plants as a guide, so far as I have observed, would be to take the mean of many observations. By doing so one might approximately, or, in cases, quite accurately, hit upon north and south.

"Professor C. E. Bessey (*American Naturalist*, August, 1877, page 486) has some accurate observation on this plant, with instructive tables showing the amount of variation. Of ninety-three leaves taken but one was accurately north and south. All the rest deviated from 15′ to 89° 30′, virtually east and west. He says: 'Taking the bearings of all the leaves observed we find that about thirty per cent. did not vary more than five degrees, forty-two per cent. not more than ten degrees, and ninety per cent. not more than forty-five degrees from the meridian.' Dr. Engelmann (*Works*, page 533, an extract from *The Gardeners' Chronicle*, February 26th, 1881), after describing the arrangement and position of the leaves of the plant, gives his opinion of their polarity by a reference as follows: 'Sir Joseph Hooker's remark about the appearance of a plain covered with this Silphium from a railroad train is quite correct, and any change in the direction of the road becomes visible at once through the altered appearance of the leaves of the Compass Plant.' This indicates a degree of reliability on its guiding power."—Ed.]

Rhododendron maximum in Connecticut.

To the Editor of Garden and Forest:

Sir,—It is not generally known that there are at least three stations in the state of Connecticut where Rhododendron maximum thrives with luxuriance under conditions which are apparently most congenial. Such a group exists near the town of Milton, Litchfield County. A visit to this place when the plants were in flower gave me an opportunity to observe a truly wonderful sight. The site is a thickly wooded swamp well up in the mountains, where for ages, apparently, there has been accumulating a peaty formation until the soil is entirely of vegetable origin for a depth of at least six to eight feet, and so soft and yielding that the larger growth of Hemlock, Yellow Birch and Black Birch, Black Ash, American Elm, Red Maple, etc., find no sufficient support, as is clearly shown by the many that have been blown down, and the others that do not stand perpendicularly. I was informed that this basin does not overflow, neither is there standing water in sight, but the soil has the appearance of having grown above the water-level by slow accumulations, and now acts like a sponge, keeping moist continually by absorption, while the heavy tree-growth overhead tends to maintain an equable temperature. It is sufficiently moist to maintain a most vigorous growth of Sphagnum and other moisture-loving Mosses, many of the woods Ferns, Boxberry, Gold Thread, Partridge-berry, etc.

This group of Rhododendrons occupies an area of about

250 feet in diameter, and is almost circular, with a detached group about 150 feet away, covering an area some twenty-five feet square. A thorough search of the vicinity, including the damp, mossy, wooded margins of the swamp, where the Kalmia produces seedlings freely, revealed not a single seedling plant of this Rhododendron.

The only apparent means of perpetuation and increase seemed to be by natural layering. In fact, it is quite impossible to pick out an independent specimen from the group, as the multitude of overlapping branches, heavy with most luxuriant leaves, force one another to the ground, where they take root, and the vigor of the new root-system establishes in each case an almost independent plant, while remaining part of the great system of layers. This network of layers, forming the great group, has become a thick and impenetrable mass of stems and heavy foliage, reaching in places to a height of ten or fifteen feet and hugging the ground at the margins. A study of the mass would lead one to infer that this species of Rhododendron, at least, will thrive luxuriantly in a soil made up entirely of vegetable mold, provided a certain degree of moisture can be maintained; also that it finds a most congenial home under the shade of tall trees, where the sunlight finds its way through the leaves but sparingly.

The preservation of this interesting group should be assured in some way, either by purchase or by the enactment of laws, to protect the plants from the depredations of visitors, who come in increasing numbers each year, I am told, breaking them down and taking away by the wagon-load not only the flowers, but often masses of roots and branch.

New Haven, Conn. *E. F. Coe.*

Church Bouquets.

To the Editor of Garden and Forest:

Sir,—The floral baseballs that in many places appear for bouquets are, perhaps, never so distressing as when seen in churches. To sit for an hour before the imprisoned flowers, cruelly crowded into a space only large enough for half a dozen, and with no spray or leaf to veil their misery, is a misfortune of itself, and it is intensified by the frightful combinations of color too often used. Simple combinations, good in design and coloring, of the material at hand from week to week throughout the season, would make a series of object-lessons that surely might fitly accompany the sermons in many a country, village or suburban church.

I have taken great pleasure in supplying bouquets for a church of this village lately, and the attention they have attracted, as well as the favorable comments heard, seems to prove that this is an opening for unobtrusive yet effective floral missionary work. I have not used imported hot-house flowers, nor anything strange or unusual, although sorely tempted to do so once or twice by delightful gifts of Orchids from more sophisticated regions, but merely the every-day material available in gardens or wildwood.

The examples have included such simple arrangements as a glass rose bowl filled with Nasturtiums in variety, with buds and leaves; jars of the branches of wild Crab Apple, cultivated Cherry and Apple blossoms, and once (a delightful find) of English Hawthorn, the branches mingled with delicate sprays of Bridal Wreath. These were all disposed openly in jars or vases of harmonious tints—clear glass seeming always a safe choice.

Necessity often led to combinations, and the first and most refined of all seemed at first glance most difficult to treat. In a slender white and light green Japanese vase ten inches high I placed, perhaps, two dozen May-apple blossoms (Podophyllum) on their full-length stems, removing the green umbrella-like leaves from all but about five or six, and below them an encircling, but not overcrowding mass of Maiden-hair Ferns. Another Sunday a crystal rose bowl held a loose bunch of nodding Bluebells with their own foliage, some of the flowers being as pink as the buds, and others flesh-colored, or nearly white. An extremely decorative bouquet was made of splendid pink Pæonies of immense size, veiled in the "smoke" of the Purple-fringe tree. This was for a special occasion, and was very large. A receptacle was constructed to suit it by propping an ordinary glass fruit-jar in an olive-green, horizontally ribbed jardinière seven and a quarter inches high and seven and a half across at the top, slightly larger below. With clear rose-pink Pæonies the combination is magical if the flowers are judiciously distributed among the feathery heads and massed more closely toward the base of the bunch.

A highly glazed vase nine inches high and seven and a half inches in diameter in the largest part, fluted vertically into melon-shaped divisions and shading in color from yellow-green at the base through greenish yellow, and reddish yellow to deep yellow-red at the neck, was made to serve for a good many bouquets despite its odd coloring. Nearly anything looks well in it except pink, rose, crimson or magenta flowers. Quite a family of bouquets that appeared from time to time in this vase were based on red, yellow-red, yellow and white Zinnias mingled with Gladioli of harmonious hues, with their own leaves, and the different small-flowered white Clematises, Cinnamon-vine, useful and delightful for bouquets and house decoration generally, and, still later in the season, with trails of Hop-vines. The gracefully drooping clusters of hops seem to lend themselves to such work in the most obliging fashion. This combination was varied by the use of perennial Sunflowers, certain red, yellow and white Dahlias, white Speciosum Lilies, etc., as opportunity offered, and occasionally a spike of Water Hyacinth was set against a background of scarlet just above the dark red of the vase, which carried out the color scheme by showing through its drooping drapery. For a feature of all of these bouquets was the use of the fine white flowers of the vines among the stiffer ones to give softness, and long branches trailing from the vase, as it stood on a small table, quite to the floor inside the altar-rail. Big bunches of Golden-rod and Asters looked wonderfully well in it, and nothing that went to church in the green-yellow-red jar attracted, nor deserved, more attention than some branches of pure yellow leaves from a Hard Maple relieved by the first spray of the scarlet, green, red and yellow foliage of the soft Maples that in certain favorable seasons transform some of our commonplace village streets into long aisles of shimmering cathedral colors.

Brighton, Ill. *Fanny Copley Seavey.*

The Forest.

The Burma Teak Forests.—III.

GIRDLING OF TEAK.

IT will now be necessary to explain that a Teak-tree before it can be cut must first be killed by girdling it. The only practicable method of bringing the Teak timber of Burma to market is by floating it. To the water's edge the logs are dragged by oxen, by buffaloes and by elephants. The dragging is done during the rains and the early part of the dry season, when the ground is moist and slippery, so that heavy timber glides easier. Down the smaller streams the logs are floated singly during the rains, and when they reach the main stream they are collected and formed into rafts. Teak timber has about the weight of Oak or Chestnut; unlike the wood of Pines and other coniferous trees, it does not float unless it is perfectly dry, and from time immemorial this has in Burma been effected by girdling the trees. A broad circular cut is made through bark and sap-wood right into the dark brown heart-wood, which, when first cut, has a beautiful golden yellowish brown color. In Teak, as in all trees with a distinctly marked heart-wood, the sap ascends through the sap-wood only; hence, if the communication of the sap-wood below and above the girdle is interrupted, the tree is killed. Within two or three days the leaves wither and the tree dies. But if the smallest thread of sap-wood is left the tree continues to live. Timber well girdled dries completely and seasons evenly, for it is on all sides freely exposed to sun and wind. Smaller trees dry sufficiently if left standing after girdling for one or two years; larger trees must stand longer. When a Teak-tree is felled green that side of the trunk which is in contact with the ground takes a long time to dry, the timber seasons unevenly, it is less useful and less durable, and when thrown into the water it does not float readily.

This excellent practice, as a matter of course, I maintained, but one of the many battles I had to fight during my Indian career was against those who condemned this practice as useless, as barbarous, as injurious to the timber, and likely to damage the reputation of Burma Teak, while others described girdling as the outcome of German theories. In reality it was an old Burmese practice, to which the good reputation of Burma Teak was mainly due.

ANNUAL YIELD FIXED.

The next question which presented itself to me after my first tour through the forests in 1856 was, what proportion of the first-class trees might be cut annually in the different forest districts. Although the proportion of first and second class trees had been found to vary much in different localities, yet, upon the whole, I considered myself justified in assuming that there were as many trees of the second class in the forests as of the first class; further, that the younger trees, those of the

third and fourth classes, were sufficiently numerous so as eventually to replace those of the second. Lastly, the data collected regarding rate of growth of the Teak-tree seemed to justify the assumption that within a period of twenty-four years all trees of the second class would grow up into first-class trees. On the ground of these data it was decided to spread the girdling of the first-class trees standing in the forests over a period of twenty-four years. The forest districts were grouped into six main divisions, a plan of operations was made for six years, and it was settled that one of the six divisions should be taken in hand each year. The valuation surveys seemed to justify the assumption that there were not less than 585,000 first-class trees in the forests, one-fourth of which, it was proposed, should be girdled during these first six years. For the selection of the trees to be girdled definite rules were laid down, the most important of which was that never more than one in four of the first-class trees in one locality should be girdled; that isolated trees should be spared, and that trees overshadowing groups of young Teak, as well as old trees and those which showed signs of decline, should be girdled in preference to others.

These provisions related to the Pegu forests only. In 1858, however, those of the adjoining provinces of Martaban and Tenasserim were added to my charge, the system of linear valuation surveys was steadily continued, so that in 1860 the Teak-trees of the different classes had been counted upon an aggregate area, in the different districts, of 35,000 acres. The plan of girdling was continued for another six years to the end of 1867 on the same principles as those adopted for Pegu in 1856. During these twelve years, from 1856 to 1867, the number of trees girdled amounted on an average to 24,300 a year. This was in the three provinces, the forests of which at that time were under my charge in Pegu, Martaban and Tenasserim, which, together with Arrakan, were subsequently united in one province under the designation of British Burma.

WORKING PLAN OF 1868.

In November, 1862, I was called to Calcutta to organize forest administration in the other provinces under the Government of India, but, though I no longer had charge of the Burma forests, I paid frequent visits to my old province and endeavored, as much as possible, to regulate the working of its forests. Thus, in 1868, I spent three months in Burma in order to prepare, with the aid of the local officers, a new working plan for the forests. Like that of 1856, this working plan was based upon the result of linear valuation surveys, and upon what was known regarding the rate of growth. The valuation surveys extended over 39,700 acres, or three per cent. of the area to which the working plan was intended to apply. The total area was divided into forty-seven districts under five main divisions, and upon the results of the valuation surveys, together with the knowledge which the local officers had acquired regarding each district, an estimate of the number of first-class trees in each district was based. For the entire area this estimate amounted to 934,000 trees, six feet in girth and upward. The estimate of 1856, it will be remembered, was for Pegu only. As regards rate of growth, convincing proof had been obtained that the concentric rings visible in Teak timber actually represented one year's growth. For younger trees this proof was obtained by the examination of trees raised in the Nilambur plantations, the oldest of which were then twenty-five years old. For older trees a fearful cyclone of October, 1864, had furnished the data; it had blown down a large number of old Teak-trees of known age planted near Calcutta, and sections of the stems were at once examined. Accordingly, the rate of growth was now based upon the counting of annual rings on butt ends of logs collected at the Rangoon timber depot. I will not weary the reader with details, suffice it to say that while the rate of growth assumed in 1856 was too rapid, that of 1868 was much too slow. No less than seventy-two years were supposed to be necessary to bring up a Teak-tree in the forests from a girth of four feet six inches to six feet, against twenty-three years in 1856. The second-class trees having also been found to be less numerous than those of the first class, it was decided to spread the removal of the latter over a period of eighty years. Thus, the maximum annual yield was fixed at 11,600 trees against 24,300, the mean number actually girdled during the first period ending in 1868. This yield was fixed for five years only, because it was hoped that rapid progress would now be made in the selection and demarcation of the forests permanently to be maintained as such, and that when the boundaries of these forests had been laid down special working plans for each forest district would then be prepared.

DEMARCATION OF RESERVED FORESTS.

However, in those days it was not all plain sailing in regard to forest matters in Burma. The theory had been advanced that the right thing to do would be altogether to abandon the care of the natural forests, to cut the marketable timber which they contained as speedily as possible, and for future timber supplies to rely entirely upon plantations to be made on the outskirts of the forests, or outside the forests in localities less feverish, where labor could be had at all seasons of the year. Vigorous progress in demarcating reserved forests was not made until 1876. Fortunately, after the five years had expired for which the working plan of 1868 had provided, girdling operations were carried on cautiously and sparingly. The result, highly beneficial as regards the development of the growing stock of Teak, was that during the period from 1868-9 to 1878-9 only 7,900 trees annually were girdled.

This may be termed the second period in regard to the working of the forests. The third period commenced in 1880, when I again spent four months in Burma. At that time a considerable area of reserves had been formed, and the work of demarcation and settlement of state forests was progressing steadily. It was time now to treat the reserves and those areas intended to be included within reserves differently from the tracts intended to be given up for the extension of cultivation. In the reserves girdling would hereafter be regulated by special working plans, while outside all marketable trees might at once be girdled. Pending the preparation of special working plans, girdling operations within the reserves were conducted very sparingly. Upon these lines the work was carried on during the fifteen years from 1879-80 to 1893-4. At first the trees girdled outside prevailed, but gradually, as special working plans were prepared, the trees girdled in these areas increased. In 1893-4 the number girdled within the limits of reserves equaled those girdled outside.

Bonn, Germany. *Dietrich Brandis.*

Recent Publications.

American Grape-growing and Wine-making. By George Husmann. New York: Orange Judd Company. 1896.

This is a new edition of a well-known book, so completely revised that it is almost a new one. Besides the original and general directions for viticulture which were prepared for the central and eastern parts of the United States, there has been added an interesting set of experiences in the form of short letters from growers of central Ohio, the Grape district of central New York, the Chautauqua belt, the Hudson River Valley, south-western Missouri, Mississippi, New Mexico and Texas. These experiences are very brief, but since they have been prepared by such men as George W. Campbell, Hermann Jaeger, Samuel Miller and T. V. Munson they ought to have considerable authority as regards the varieties suited to different regions.

The chapters devoted to wine-making do not pretend to go into any elaborate explanations of the special processes and refinements of the art, but simply to set forth in a plain way the rules which are necessary for the grower who wishes to make a palatable wine for home use and to enable the small vineyardist to produce an article which will be salable. All that the novice needs to know of cellars and cellar furniture, of the methods of gathering and pressing and fermenting, is here briefly told, and there is an enumeration of the varieties which are best adapted for making various kinds of wine. Grape-growing in California, where the Vines are all of the Vinifera type and where the climate has little resemblance to that of the east, is quite a different art from grape-growing here, where the varieties are all selected and improved native sorts, with only an occasional infusion of foreign blood. Wine-making in the east and in the west differs quite as widely. With grapes as cheap as they have been for several seasons at wholesale, it ought to be possible in California, in New York, and especially in our south-western states, to make a wine that is at once cheap, pure and and palatable. If this has been done to any large extent in America the fact does not seem to be generally known among wine drinkers.

Notes.

According to *The Gardeners' Magazine*, candidates for degrees in horticulture in the Victoria University, in addition to their written papers, will be tested by a practical examination to show their proficiency. It would be interesting to know more specifically what is the nature of this practical examination.

Mr. Carman speaks in high praise of the Pea, New Life, which he considers the most productive and valuable of its season. On the 6th of July the vines were two feet high, vigorous and of uniform growth, and the straight bright green pods, three to four inches long, each contained from five to eight seeds of the largest size. The peas mature just before those of Stratagem and Heroine.

A correspondent of *The Rural New Yorker* writes that the Crimson Rambler Rose does all that has been claimed for it, is especially good in foliage and in the abundance of its large clusters of flowers. He notes two defects, however, one of which is that it is not as fragrant as a good rose should be, and the second is that the flowers which open first begin to drop their petals before the others expand, and in this way the beauty of the whole cluster is marred.

At the exhibition of the Massachusetts Horticultural Society on August 8th, a silver medal was awarded to Mr. Robert Cameron, of the Harvard Botanic Garden, for a display of the flowers of showy annuals. The collection filled two hundred large vases and embraced 140 species and varieties. Mr. Cameron also received from the same society on the 25th of July a silver medal for the flowers of perennial herbaceous plants, which filled 150 vases and consisted of eighty species and varieties.

In the making of wine in California there is considerable loss on account of the undue heat, which arrests fermentation before the proper time, so that the wine must be graded as inferior or else made into brandy. Professor Hayne, of the University of California, has devised a machine for reducing the temperature of wine at fermentation by bringing it into contact with cold water pipes. The apparatus has been tested successfully at the University, and it is to have a practical trial at once in one of the largest vineyards in Sacramento County.

For some years inventors have been trying to transport fruit in cars filled with carbonic acid gas. Inasmuch as the germs of fermentation cannot live in this gas it is assumed that no ice would be needed, and since this is both heavy and expensive it is thought that fruit can be transported for long distances much more cheaply in the new way. A car-load of fruit in one of these gas cars was lately sent from San José, California, to Chicago, but the result was not satisfactory. It is reported in the local papers that the fruit had not rotted, but owing to the extreme hot weather it had almost been cooked. Ice will still be a necessity in very hot weather unless some means of keeping the car cool is added to the antiseptic advantages of the gas.

We have received from Mr. William Tricker flowers of Nymphæa Sturtevantii, which was figured in this journal, vol. vii., page 354, and also of N. O'Marana, which we described in our last volume, page 95. The latter flowers are considerably larger, being nearly a foot across, with heavier stems and of a pink so deep as to be almost red, but since the petals of this flower grow darker with age they may have been originally of no richer color than those of N. Sturtevantii. Altogether the new Lily seems an improvement upon its parent—it is a cross between N. dentata and N. Sturtevantii—especially since Mr. Tricker says that it is more floriferous, that it grows more freely, and, in fact, quite as freely as any other plant of its class.

A correspondent of the *Arizona Gazette* writes that the setting apart of the San Carlos Reserve for the Apache Indians twenty years ago has preserved "the largest continuous belt of forest in the United States," namely, that which clothes the Mongallon and the Sierra Blanca. In southern Arizona the forests have largely been sacrificed to the interests of the stockmen and lumbermen, and the rich, fine soil that once covered hill and valley has already been scoured and gullied until in many places nothing but the rock skeleton of the landscape remains. The writer urges that this San Carlos forest, which has thus far been saved with some that lies adjacent, ought to be rescued and set apart as a forest reservation since the Salt, the Verde and the Little Colorado rivers all take their rise and receive their supply from this source.

Mangoes from the West Indies are rather more common in the fancy-fruit stores than usual this year, but whether it is because only inferior varieties are sent here, or because the fruits are picked too green, the fact is that none of the samples which reach this city justify the high esteem with which this fruit is held in the tropics. As a rule, in the West Indies little care is taken to select and improve varieties, and, no doubt, the seedlings of this tree, Mangifera Indica, vary quite as much as apples do. Mammee apples of fair size are also now to be had, and are often four or five inches in diameter. In its native habitat the fruit is often as big as a child's head and of a beautiful yellow color. The flesh has an aromatic flavor, and as received here it is palatable when served with wine and sugar. Alligator pears, the fruit of Persea gratissimum, come here in much better condition than the two fruits named above, and there is an increasing demand for them on account of their firm, marrow-like pulp, which is more often served here as a salad than in any other way.

Mr. Joseph Meehan writes to *The Country Gentleman* that Clapp's Favorite is esteemed about Philadelphia as the very best of early pears. This fruit should not be condemned because it rots at the core when overripe, as this can be avoided if one knows how to ripen it properly. The first picking in that part of Pennsylvania was made this year before the end of July, and in late seasons it should be picked before the middle of August. The fruit is gathered in three installments about a week apart to have a succession, and if it is put in a close closet it will be in fit condition to eat in a week or ten days. Of course, it does not keep well—no early fruit does—but when ripened in this way it is a beautiful fruit, perfect throughout, juicy and refreshing. One good quality of this variety is that it rarely fails to bear a good crop. In a little orchard well known to Mr. Meehan it has not missed a good crop for ten years, and now when there is not a fruit on Tyson, Sheldon Jones and Belle Lucrative, and but a few on Bartlett and Lawrence, trees of Clapp's Favorite are bending with their load of fruit.

There never has been a more trying week for fruiterers and greengrocers in this city than the last. With a temperature at ninety-five degrees fruit ripens so rapidly that it must be sold at once or not at all. Pears which were green in the morning were dead ripe in the afternoon and hardly fit to use next day. This trouble was aggravated by an unusually large supply, and since buyers had little energy for anything beyond the effort to keep themselves cool with iced drinks, it is little wonder that all kinds of fruit were sold at sacrificing figures. Tragedy prunes are about past and Gros prunes are just beginning to arrive. Highly colored apples of fine size when carefully collected and packed are selling fairly, but ordinary kinds like Orange Pippins can hardly be given away. Early apples are always an uncertain crop for growers, as they must be disposed of quickly, being almost as perishable as peaches. Besides this, few summer apples are of such high quality as the later ones. But, after all, the very best of sauce is made with the summer fruit, and good fresh-apple sauce is quite as appetizing and wholesome as any berries or other fruit of the season.

The great Hale Peach orchard, in Georgia, covers 1,078 acres, 600 of which are in bearing trees, and the remainder in nursery stock. There are avenues running north and south through the orchard 500 feet apart, with a cross road every 1,000 feet. There are two large packing-houses a hundred feet long and forty feet wide and two stories high, and a lodging-house or hotel has just been built for the help. Last year some four hundred helpers camped in barns, wagons, tents, etc. At picking-time about five hundred men and women, chiefly colored, and seventy-five horses and mules are employed, while fifty men and thirty mules are employed the year round. At the lodging-house rooms and beds are free, and board costs $2.50 a week, while families and parties can furnish their own food and have it cooked for themselves if they choose. This year the curculio attacked the Peaches, and Mr. Hale waged prompt war upon the insects, jarring the trees and catching the insects in sheets tacked to light semicircular hoop frames. Two of these were brought together about a tree which was struck by a rubber-padded club, and the insects which dropped were then thrown into buckets and carried by boys to barrels in wagons and drawn away to be burned with the stung fruit which dropped with them. Fifty men were busy for nearly two months, from early April onward, at this work, which cost $4,000. But while in other orchards from sixty to ninety per cent. of the fruit was lost, and in some orchards the entire crop, the Hale orchard alone had a full crop, and many of the trees were so overloaded that they required severe thinning by hand.